WHAT IS CLAIMED IS:

1. A superheterodyne receiver suitable receiving RF energy in an upper frequency band and a lower frequency band and for translating the received RF energy to an output frequency, the receiver comprising:

at least one attenuator for attenuating the received RF energy;

a first mixer arranged for mixing the RF energy in the lower frequency band with a first local oscillator signal to produce a signal at a first intermediate frequency;

a second mixer arranged for mixing the RF energy in the upper frequency band with the first local oscillator signal to produce a signal at a second intermediate frequency;

a switch arranged to direct the first local oscillator signal to the first mixer or to the second mixer; and

a third mixer for mixing a second local oscillator signal with the signal at the first intermediate frequency or with the signal at the second intermediate frequency to produce a signal at the output frequency.

2. The superheterodyne receiver according to claim 1, wherein the at least one attenuator includes

a first attenuator coupled to an input of the first mixer to attenuate the RF energy in the lower frequency band, and

a second attenuator coupled to an input of the second mixer to attenuate the RF energy in the upper frequency band.

3. The superheterodyne receiver according to claim 2, further comprising:

a first RF limiter coupled to the first attenuator for limiting the amplitude of the RF energy in the lower frequency band; and

a second RF limiter for limiting the amplitude of the RF energy in the upper frequency band.

4. The superheterodyne receiver according to claim 2, wherein at least the first attenuator is tunable.

5. The superheterodyne receiver according to claim 2, the first attenuator being a tunable 30dB attenuator.

6. The superheterodyne receiver according to claim 2, at least the first attenuator being a MMIC component.

7. The superheterodyne receiver according to claim 1, further comprising:

a first input arranged for receiving RF energy in the lower band and transferring the RF energy to the first mixer; and

a second input arranged for receiving the RF energy in the upper band and transferring the RF energy to the second mixer.

8. The superheterodyne receiver according to claim 1, further comprising:

at least one gain block arranged for amplifying the signal at the first intermediate frequency; and

at least another gain block arranged for amplifying the signal at the second intermediate frequency.

9. The superheterodyne receiver according to claim 8, wherein the gain blocks are MMIC components.

10. The superheterodyne receiver according to claim 1, further comprising:

a first bandpass filter arranged to receive and filter an output of the first mixer, the first bandpass filter having a bandwidth encompassing the first intermediate frequency; and

a second bandpass filter arranged to receiver and filter an output of the second mixer, the second bandpass filter having a bandwidth encompassing the second intermediate frequency.

11. The superheterodyne receiver according to claim 10,

the first bandpass having a bandwidth excluding other signals generated in the first mixer,

the second bandpass filter having a bandwidth excluding other signals generated in the second mixer.

12. The superheterodyne receiver according to claim 10, further comprising:

a third bandpass filter arranged to receiver and filter an output of the third mixer, the third bandpass filter having a bandwidth encompassing the output frequency.

13. The superheterodyne receiver according to claim 12, the first, second , and third bandpass filters being printed bandpass filters.

14. The superheterodyne receiver according to claim 1, wherein the first mixer, the second mixer, and the third mixer are drop-in components.

15. The superheterodyne receiver according to claim 1, wherein

the receiver has no filter and no amplifier between the input and the first mixer, and

wherein the receiver has no filter and no amplifier between the input and the second mixer.

16. The superheterodyne receiver according to claim 1, further comprising:

a first local oscillator for producing the first local oscillator signal;

a tuner for tuning the first local oscillator signal through a range of frequencies.

17. The superheterodyne receiver according to claim 1, further comprising:

at least one of a dielectric resonance oscillator and a phase locked loop synthesizer for producing the second local oscillator signal.

18. The superheterodyne receiver according to claim 1, further comprising:

a dielectric resonance oscillator;

a phase locked loop synthesizer; and

a switch arranged for directing a second local oscillator signal from the dielectric resonance oscillator or the phase locked loop synthesizer to the third mixer.

19. The superheterodyne receiver according to claim 18, wherein the switch is a MMIC component.

20. The superheterodyne receiver according to claim 1, wherein the first intermediate frequency is greater than an upper limit of the lower frequency band, and the second intermediate frequency is lower than a lower limit of the upper frequency band.

21. The superheterodyne receiver according to claim 1, wherein the output frequency is within the lower frequency band.

22. The superheterodyne receiver according to claim 20, wherein output frequency is less than the first intermediate frequency and the second intermediate frequency.

23. The superheterodyne receiver according to claim 1, wherein the first intermediate frequency is about 9 gigahertz and the second intermediate frequency is about 3 gigahertz.

24. The superheterodyne receiver according to claim 23, wherein the output frequency is about 1 gigahertz.

25. The superheterodyne receiver according to claim 23, wherein the output frequency is about 160 megahertz.

26. The superheterodyne receiver according to claim 1, wherein

the lower frequency band is about 100 megahertz to about 6 gigahertz,

the upper frequency band is about 6 gigahertz to about 18 gigahertz,

the first local oscillator frequency is between about 9 gigahertz and about 15 gigahertz, and

the first intermediate frequency is about 9 gigahertz.

27. The superheterodyne receiver according to claim 1, the receiver having at least 30 dB instantaneous dynamic range and at least 60 dB total dynamic range.

28. The superheterodyne receiver according to claim 1, further comprising:

a power source.

29. The superheterodyne receiver according to claim 1, further comprising:

a first module having a housing, an output for the output signal, at least one input for the received RF energy, at least one input for the first and second local oscillator signals, the first mixer, the second mixer, the third mixer, the switch, and the at least one attenuator;

a second module having at least one source for the first and second local oscillator signals within a second housing, and at least one output for the first and second local oscillator signals; and

a signal path between the first and second modules for transmitting the first and second local oscillator signals to the first module.

30. A scanning superheterodyne receiver suitable for receiving RF energy in an upper frequency band and a lower frequency band and for translating the received RF energy to an output frequency, the receiver comprising:

at least one input for receiving the RF energy;

at least one attenuator for attenuating the received RF energy;

a first mixer arranged for mixing a first local oscillator signal with the RF energy in the lower frequency band to produce a signal at a first intermediate frequency;

a second mixer arranged for mixing the first local oscillator signal with the RF energy in the upper frequency band to produce a signal at a second intermediate frequency;

a switch configured to direct the first local oscillator signal either to the first mixer or to the second mixer;

a third mixer for mixing a second local oscillator signal with the signal at the first intermediate frequency or the signal at the second intermediate frequency to produce a signal at the output frequency; and

a tuner for tuning the first local oscillator signals through a range of frequencies.

31. A superheterodyne receiver suitable receiving RF energy in a lower frequency band and an upper frequency band above the lower frequency band, the receiver comprising:

a source for a first local oscillator signal, the first local oscillator signal having a range of frequencies within the upper frequency band;

at least one input for receiving the RF energy;

a first mixer arranged for mixing the RF energy in the lower frequency band with the first local oscillator signal to produce a signal at a first intermediate frequency;

at least one filter arranged to bandpass filter the signal produced by the first mixer, the first mixer folding any interfering frequencies produced by the first mixer outside the bandwidth of the filter;

a second mixer arranged for mixing the RF energy in the upper frequency band with the first local oscillator signal to produce a signal at a second intermediate frequency; at least one filter arranged to bandpass filter the signal produced by the first mixer, the first mixer folding any interfering frequencies produced by the second mixer outside the bandwidth of the filter;

a third mixer for mixing a second local oscillator signal with the signal at the first intermediate frequency or with the signal at the second intermediate frequency to produce a signal at the output frequency, the output frequency being lower than the first and the second intermediate frequencies; and

at least one output for outputting the output signal.

32. A method for receiving RF energy and translating the RF energy to a predetermined output frequency in a superheterodyne receiver, the receiver having a mixer for mixing the received RF energy in a lower band with a first local oscillator signal and another mixer for mixing the received RF energy in an upper band with the first local oscillator signal, the method comprising:

mixing the first local oscillator signal and the received RF energy in the lower band to produce a signal at a first intermediate frequency above the frequency of the received RF energy in the lower band and the frequency of the first local oscillator signal, or

mixing the first local oscillator signal with the received RF energy in the upper band to produce a signal at a second intermediate frequency, the second intermediate frequency

being lower than the frequency of the received RF energy in the upper band and the frequency of the first local oscillator signal, and

mixing a third local oscillator signal with the signal at the first intermediate frequency or with the signal at the second intermediate frequency to produce an output signal at the output frequency, the output frequency being lower than the respective first or second intermediate frequency.

33. The method according to claim 32, further comprising:

passing the first intermediate signal through at least one filter having a bandwidth encompassing the first intermediate frequency,

wherein the mixing of the first local oscillator signal with the incoming RF energy in the upper or lower band folds interfering frequencies outside the bandwidth of the filter.

34. The method according to claim 32, without any pre-selection filtering of the received RF energy.

35. The method according to claim 32, further comprising:

passing the second intermediate signal through at least one filter having a bandwidth encompassing the second intermediate frequency,

wherein the mixing of the first local oscillator signal with the incoming RF energy folds any interfering frequencies in the mixer outside the bandwidth of the filter.

36. The method according to claim 32, further comprising:

varying the first local oscillator signal through a range of frequencies.

37. The method according to claim 32, wherein the second local oscillator frequency is less than the first intermediate frequency, and the output resulting from received RF energy in the lower band is inverted.

38. The method according to claim 32, wherein the second local oscillator frequency is higher than the first intermediate frequency, and the output resulting from received RF energy in the lower band is non-inverted.

39. The method according to claim 32, wherein the second local oscillator frequency is less than the first intermediate frequency.

40. The method according to claim 39, wherein the output resulting from received RF energy in the upper frequency band is inverted.

40. The method according to claim 38, wherein the output resulting from received RF energy in the upper band is non-inverted.

41. The method according to claim 38, wherein the range of frequencies of the first local oscillator signal is about twice as large as the upper frequency band, wherein the output resulting from received RF energy having a frequency in a lower half of the upper frequency band is inverted, and wherein the output resulting from received RF energy having a frequency in an upper half of the upper frequency band is non-inverted.

42. The method according to claim 32, wherein the second local oscillator frequency is greater than the first intermediate frequency.

43. The method according to claim 42, wherein the output resulting from received RF energy in the lower band is inverted when the received RF energy is in an upper portion of the upper frequency band.

44. The method according to claim 42, wherein the output resulting from received RF energy in the lower band is non-inverted when the received RF energy is in a lower portion of the upper frequency band.

45. The method according to claim 42, wherein the range of frequencies of the first local oscillator signal is about twice as large as the upper frequency band, wherein the output resulting from received RF energy having a frequency in a lower half of the upper frequency band is non-inverted, and wherein the output resulting from received RF energy having a frequency in an upper half of the upper frequency band is inverted.

46. The method according to claim 32, wherein the lower frequency band is about 100 megahertz to about 6 gigahertz, and the upper frequency band is about 6 gigahertz to about 18 gigahertz.

47. The method according to claim 32, wherein the first intermediate frequency is about 9 gigahertz, and the second intermediate frequency is about 3 gigahertz.

48. The method according to claim 32, wherein the output frequency is about 1 gigahertz.

49. The method according to claim 32, wherein the output frequency is about 160 megahertz.

50. A superheterodyne receiver suitable receiving RF energy in an upper frequency band and a lower frequency band and for translating the received RF energy to an output frequency, the receiver comprising:

a local oscillator module having at least one local oscillator source;

at least two converter modules for converting the received RF energy to the output frequency; and

at least one connection between the local oscillator module and the converter modules to transmit the local oscillator signals to the converter modules,

each of the converter modules having

a first mixer arranged for mixing the RF energy in the lower frequency band with a first local oscillator signal from the local oscillator module to produce a signal at a first intermediate frequency;

a second mixer arranged for mixing the RF energy in the upper frequency band with the first local oscillator signal from the local oscillator module to produce a signal at a second intermediate frequency, and

a third mixer for mixing a second local oscillator signal from the local oscillator module with the signal at the first intermediate frequency or with the signal at the second intermediate frequency to produce a signal at the output frequency.

51. The receiver according to claim 50, each of the converter modules having a a switch arranged to direct the first local oscillator signal to the first mixer or to the second mixer.

52. The receiver according to claim 50, each of the converter modules having an attenuator arranged to attenuate the received RF energy and to input the attenuated RF energy to the first mixer or the second mixer.

53. The superheterodyne receiver according to claim 50, wherein the converter modules produce identical output signals suitable for coherent processing of the output signals.